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# PATENT SPECIFICATION

Convention Date (Switzerland) : July 16, 1928.

**315,718**

Application Date (in United Kingdom) : July 16, 1929. No. 21,874 / 29.

Complete not Accepted.

## COMPLETE SPECIFICATION.

### Internal Combustion Engine.

We, the KEL-CHA-MOTOR A.G., of Camorino, Switzerland, a Company registered under the Laws of Switzerland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described in and by the following statement:—

Combustion motors have to-day reached a high perfection and reliability; repairs, however, can not fully be avoided even with the greatest care in maintenance. Such repair work, depending on the particular design and specially with motor-car and motor-bicycle engines is sometimes very difficult to carry out, and always necessitates the taking off of parts which do not require any repairing. Apart from the greater costs of the repair work, this unnecessary taking adrift is harmful to the engine and the car or bicycle.

The present invention enables a quick and reliable repair, avoiding all unnecessary operations. All movable engine parts, such as crankshaft, camshaft, governing wheels, gear wheels, flywheel and coupling, valve spindles with guides, piston rod and cylinder sleeve, according to this invention are all mounted and supported on a special frame. This frame inclusive of the before mentioned parts is inserted in the engine frame proper and for the purpose of controll, repair or replacement of individual parts, can be withdrawn and attended to without the need of removing the engine frame proper and without involving parts which are not affected.

The present invention embraces internal combustion engines of all sizes and types and can be designed with the recognized principles either with sideway- or top-governed valves.

The accompanying drawing illustrates one way of carrying the invention into effect as a motorbicycle engine. Fig. 1 gives a cross section of an elevation, Fig. 2 shows a side-view. The above mentioned movable parts built into the frame, are omitted in Fig. 2.

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The drawing 1 indicates the said frame, 2 the crankshaft, 3 the piston-rod, 4 the piston, 5 the camshaft with valve drive, 6 the governing wheels, 7 the oilpump, 8 the flywheel, 9 the coupling, 10 the gearwheels, 11 the cylinder sleeves, 12 the valve spindels, 13 the cylinder head, 14 the covers of the crankshaft bearings, 15 the covers of the gear bearings, 16 the oiltank, 17 the Cardan shaft, 18 the gear shaft, 19 the driving wheel of the cardan, 20 the gearwheel of the gear shaft, 21 the bolts for fixing the frame, 22 rubber pads, 23 the engine frame.

An engine according to this invention consists of an engine frame 23 of light or heavy-metal, which is screwed on to the chassis of the vehicle. This frame 23 carries the cylinder head 13 and at its lower end is closed by a cover 16, which serves at the same time as oiltank.

The crankshaft 2, the piston-rod 3, piston 4, camshaft 5 with valve drive, governor wheels 6, oilpump 7, flywheel 8, coupling 9 and gearwheels 10 as well as the cylinder sleeves 11 are all carried by and mounted on the light or heavy-metal frame 1. This frame 1, together with the aforesaid movable engine parts is inserted the engine frame proper 23 from the bottom and after the oiltank 16 has been removed. The valves are carried in the cylinder head 13. The drive of the cardan shaft 17 from the gear is effected by two gearwheels 19 and 20 or by a loose link. This way of connecting the gear shaft 18 with the cardan shaft 17 as it is illustrated in Fig. 3 has the advantage of easy disengagement, as the gearshaft 18 together with the gearwheel 20 can simply be dropped. The gearwheels 19 and 20 can be fitted with straight or spiral teeth and be of any size, they may accelerate or retard the movement between gear shaft and cardan shaft or propeller shaft. The driving handle is supported in the frame 23, further the starter, magnet, distributor and dynamo are also mounted on this frame 23 and can easily be set after the

removal of a cover. Magnet and dynamo are overhanging, i.e. the usual bridge becomes obsolete so that these two parts can be taken off, after the unfastening of a few screws. For motor-bicycles a rubber pad is provided which will damp and absorb vibrations of the motor and thus reduce the wear and take of the movable parts. For autocar-engines, the frame, according this invention may consist of two or more parts; for example the motor parts may be built into one part thereof and the parts of the gear into the other part of the frame. In accordance with such an arrangement the oil-tank and the cover of the cardan may consist of two or more parts.

The covers of the bearings of the frame are preferably so designed that they serve as supports for the cylinder sleeve; in the same way the covers of the gearbearings at the same time serve as supports for the speed governor shaft. All of these parts however for cleaning, control or overhaul can be taken individually adrift after unscrewing a few bolts. The repair or revision of an engine according this invention then proceeds as follows:

The oiltank is first taken off by unscrewing its bolts, after that the motor and gear frame 1 is untied and the frame together with all of the enumerated parts can now be withdrawn. The replacement of the defect part can now comfortably be done and also all other motor and gear parts be checked. Afterwards the frame is inserted and screwed on again, the oil-tank adapted and the engine is ready for service.

40 The present invention thus does away with all unnecessary operations, there is for example no need to move the cooler, to dismantle the carburetor, to unfasten the exhaust pipe, to take off the cylinder head, to disengage the cardan, to remove the cover for the governor wheels, to withdraw the engine, to disconnect cables, to remove pedals and so on. It is not even necessary to shut the fuel cock.

50 The parts not affected by the repair or overhaul and their fixing is not touched and tampered with which not only means a direct saving in time and costs but at the same time protects the whole vehicle.

55 The sealing of this engine is simple as only the oiltank and possibly the inspection cover for the ignition must be made tight.

60 The cleaning of the combustion room and pistonhead as well as the grinding in of the valves, both for top and sideways governed engine, can take place after the cylinder head has been taken off.

65 The sideways governed valves can be set after removing a side cover, the top

governed valves are set in line with standard practice. The engine frame proper 23 need in no case be removed from the cars chassis.

A further substantial advantage of an engine according this invention lies in the fact that the car must not be specially run in. The frame together with all movable engine- and gear-parts is simply submerged in an oilbath of suitable temperature and therein driven by a belt or the like in the workshops.

The frame on which this invention rests can be applied for all existing types of internal combustion engines.

Fig. 1 illustrates further how on the line of this invention also the battery with starter and the dynamo can be incorporated in and carried by the engine frame proper. This arrangement simplifies the design of the machinery and protects these vital parts from dirt.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1) Combustion engine wherein all movable engine parts as crankshaft, camshaft, governor wheels, gearbox, flywheel and coupling, valve spindles and guides, piston rod with piston and cylinder sleeve, are mounted and supported on a separate frame, which frame together with the said parts is pushed into the engine frame proper and which for the purpose of repair, overhaul and replacement of individual parts can be withdrawn as a unit, without removing the engine frame from the chassis and without affecting and dismantling intact parts.

2) Combustion engine as in claim 1), wherein the frame carrying the enumerated movable parts is built up of two or more sections.

3) Combustion engine as in claim 1), wherein the bearing covers of the frame carrying the enumerated movable parts, serve as supports for the cylinder sleeves.

4) Combustion engine as in claim 1), wherein the covers of the gearbearings serve as supports for the speed governor shaft.

5) Combustion engine as in claim 1), wherein the connection between gear shaft and cardan shaft consists of two gear wheels of arbitrary ratio and straight or spiral teeth.

6) Combustion engine as in claim 1), wherein the cylinder sleeves are mounted with flanges on the frame.

7) Combustion engine as in claim 1), wherein the dynamo is incorporated in and enclosed by the engine frame proper.

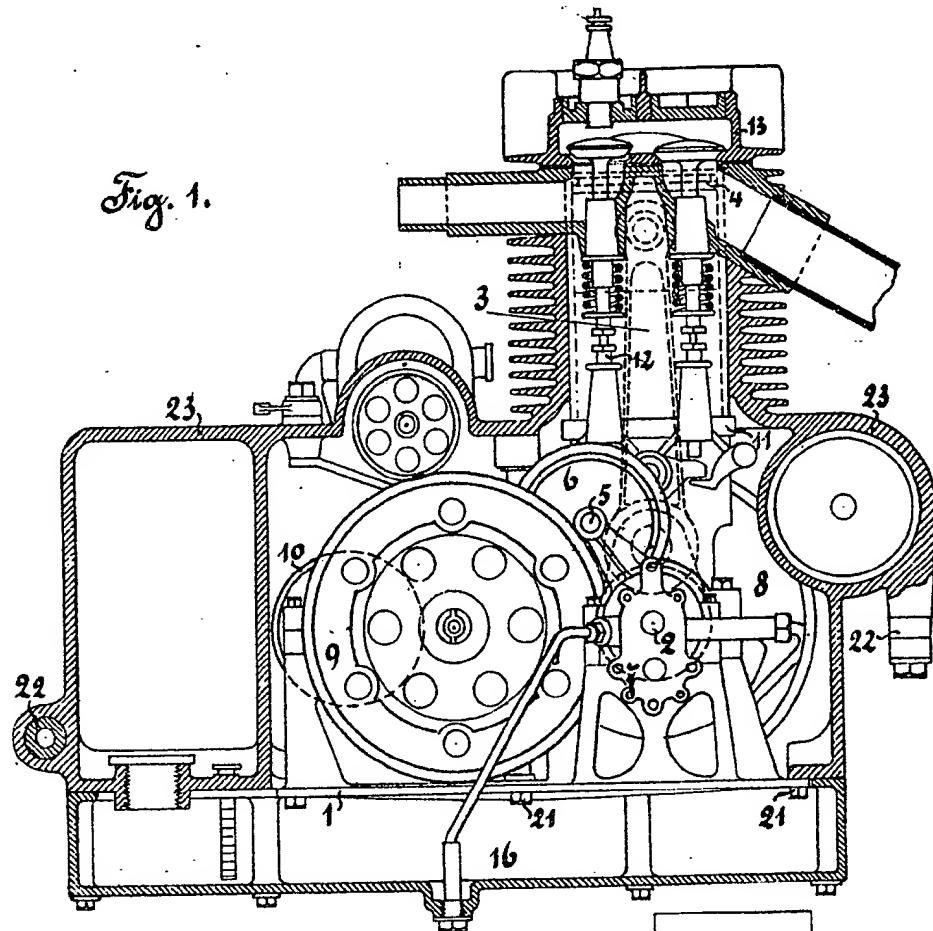
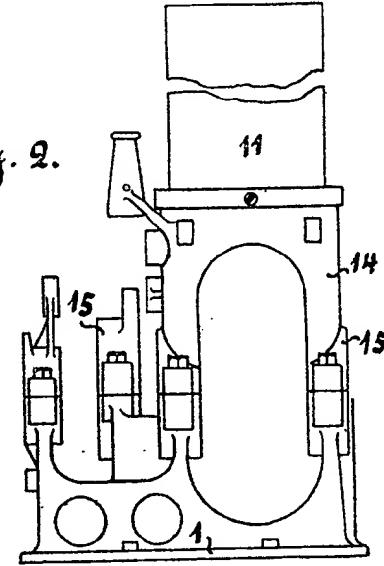
8) Combustion engine as in claim 1),

wherein the magnet-battery and the  
starter are enclosed and carried by the  
frame proper.

Dated this 16th day of July, 1929.

**MARKS & CLERK.**

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*Fig. 1.**Fig. 2.**Fig. 3.*